2009 California Climate Adaptation Strategy

A Report to the Governor of the State of California
in Response to Executive Order S-13-2008

California natural resources Agency

development inside future hazard zones in most cases if new protective structures would be necessary (strategy 1a). Additional strategies include (1) directives to promote innovative approaches to redesigning coastal structures, where feasible, that are resilient to the impacts of climate change and can serve to protect existing development in low-lying areas (strategy 1b), and (2) creation of statewide guidance and regional planning forums to help local governments update local plans and make planning decisions in light of sea-level rise (strategies 2a and 4c).

All levels of government are encouraged to consider:

- Incentive programs to encourage property owners in high-risk areas to relocate or limit future development.
- Clustering new development in areas considered to have a low vulnerability to sea-level rise.
- Creating additional buffers and setbacks for new construction to minimize risks to people and property and to protect coastal resources such as natural habitat and recreational areas (see strategy 4c).

Critical coastal and ocean habitats and recreational areas should be protected and maintained to the extent feasible. The state should identify priority conservation areas and recommend lands that should be considered for acquisition and preservation, especially vulnerable shoreline areas containing critical habitat or opportunities for habitat creation (strategy 1c). Future sea-level rise estimates should be considered during restoration efforts (i.e., grading levels for wetland restorations), and natural shoreline enhancements (e.g., species such as native oysters, eelgrass) should be designed to promote sedimentation and protect against shoreline erosion.

Adaptation Strategies and Actions

The Coastal Adaptation Working Group has identified the following priorities in addressing climate adaptation for California state agencies. The near-term actions referenced below are those actions that have been identified and which can be initiated or completed by 2010, if, in some cases, related statutory or regulatory changes are made. The long-term actions include those that will require support from that state and collaboration with multiple state agencies or that require significant legal or regulatory changes.

Strategy 1: Establish State Policy to Avoid Future Hazards and Protect Critical Habitat.

Near -Term Actions:

a. **Hazard Avoidance Policy** – State agencies should consider project alternatives that avoid significant new development in areas that cannot be adequately protected (planning, permitting, development, and building) from flooding or erosion due to climate change.
The most risk-averse approach for minimizing the adverse effects of sea level rise and storm activities is to carefully consider new development within areas vulnerable to inundation and erosion, and to consider prohibiting development of undeveloped, vulnerable shoreline areas containing critical habitat or opportunities for habitat creation. State agencies should generally not plan, develop, or build any new significant structure in a place where that structure will require significant protection from sea-level rise, storm surges, or coastal erosion during the expected life of the structure. However, vulnerable shoreline areas containing existing development or proposed for new development that has or will have regionally significant economic, cultural, or social value may have to be protected, and in-fill development in these areas should be closely scrutinized. State agencies should incorporate this policy into their decisions, and other levels of government are also encouraged to do so. Some state agencies already base decisions on hazard avoidance, for example Coastal Act provisions require that new development in the coastal zone be designed to minimize risks from current and future hazards, which would include

risks from expected sea-level rise, the Act restricts new development in hazardous areas, especially if it would require the construction of a protective device.

b. **Innovative Designs –** If agencies do plan, permit, develop or build any new structures in hazard zones, agencies should employ or encourage innovative engineering and design solutions so that the structures are resilient to potential flood or erosion events or can be easily relocated or removed to allow for progressive adaptation to sea level rise, flooding, and erosion.

c. **Habitat Protection –** The state should identify priority conservation areas and recommend lands that should be considered for acquisition and preservation. The state should consider prohibiting projects that would place development in undeveloped areas already containing critical habitat, and those containing opportunities for tidal wetland restoration, habitat migration, or buffer zones. The strategy should likewise encourage projects that protect critical habitats, fish, wildlife and other aquatic organisms and connections between coastal habitats. The state should pursue activities that can increase natural resiliency, such as restoring tidal wetlands, living shoreline, and related habitats; managing sediment for marsh accretion and natural flood protection; and maintaining upland buffer areas around tidal wetlands. For these priory conservation areas, impacts from nearby development should be minimized, such as secondary impacts from impaired water quality or hard protection devices.

Long -Term Actions:

d. **Coordinate Policy Implementation** – State agencies should use outreach and incentive programs to promote hazard avoidance policies and sound management decisions for coastal habitat protection and development to all levels of government.

Strategy 2: Provide Statewide Guidance for Protecting Existing Critical Ecosystems, Existing Coastal Development, and Future Investments

Significant and valuable development has been built along the California coast for over a century. Some of that development is currently threatened by sea-level rise or will be threatened in the near future. Similarly, the coastal zone is home to many threatened or endangered species and sensitive habitats. We must acknowledge that the high financial, ecological, social and cultural costs of protecting everything may prove to be impossible; in the long run, protection of everything may be both futile and environmentally destructive. Decision guidance strategies should frame cost-benefit analyses so that all public and private costs and benefits are appropriately considered.

Near -Term Actions:

a. **Establish Decision Guidance** – The OPC in close coordination with other state resource agencies should develop a statewide framework that can be used by state and local agencies as guidance in preparation of adaptation plans. This guidance should discuss current regulatory and legal frameworks and whether changes are necessary to pursue this approach to adaptation. In addition the OPC should incorporate this new guidance within existing decision-making processes as much as possible and tailor it, when necessary, to specific regional approaches (see strategy 4c)..

It should consider three key questions for helping to design and locate proposed or existing structures that may be threatened by sea-level rise:

1. Is the existing or proposed structure either necessary for the health, safety, or welfare of an entire region, or is it located within a hazard area for which protection will be provided because of surrounding high-value development?
2. Is it infeasible to relocate an existing structure or site a new structure outside the hazard area and still provide this health, safety, or welfare function?

3. Will relocating an existing or proposed structure provide habitat protection or recreational opportunities that may be otherwise lost if that structure is built or is protected along the coast?

Additional questions that should be considered in the preparation of the framework include:

- Is there a feasible "soft" protection solution (i.e., can a barrier beach or wetland be used instead of a seawall)?
- Will the protection approach, retrofit, or new design:
  - i. Be necessary to protect an existing structure threatened by erosion?
  - ii. Allow continuation of important natural processes, such as littoral drift, and avoid any impacts to neighboring habitats or structures?
  - iii. Result in the loss of state tidelands or beaches?
  - iv. Provide a long-term solution to the threats caused by sea-level rise?
  - v. Be resilient over a range of sea-level rise possibilities?
  - vi. Provide broad protection to existing developed areas?
  - vii. Protect structures of high cultural or social value?
  - viii. Provide for a natural shoreline (i.e., can seawalls be designed to include habitat)?
  - ix. Be coordinated with proposed actions for other infrastructure in the same flood hazard area?
  - x. Cost less than the value of the structure to be protected?
  - xi. Provide mitigation for adverse impacts that cannot be avoided?

Long -Term Actions:

b. **Pilot Studies** – Develop pilot studies in cooperation with specific cities/state agencies that will examine the efficacy and utility of the framework highlighted above.

Strategy 3: State Agencies Should Prepare Sea-Level Rise and Climate Adaptation Plans

Near -Term Actions:

a. **Adaptation Planning** – By September 2010 state agencies responsible for the management and regulation of resources and infrastructure subject to potential sea-level rise should prepare agency-specific adaptation plans, guidance, and criteria, as appropriate. Agencies with overlapping jurisdictions in the coastal zone will coordinate when drafting these plans to reduce or eliminate conflicting approaches.
   - i. The Coastal Commission, the San Francisco Bay Conservation and Development Commission, the state and Regional Water Quality Control Boards, California State Parks, and the State Lands Commission should continue to develop adaptation strategies that can be implemented through their existing planning and regulatory programs.
   - ii. The Coastal Conservancy, the Ocean Protection Council, and the Wildlife Conservation Board should continue to develop criteria to guide their financial decisions and ensure that projects are designed to consider a range of climate change scenarios.
   - iii. The California Department of Transportation, State Parks, the Department of Water Resources, the Department of Fish and Game, the State Lands Commission, and other state agencies that own land and facilities along the coast should develop policies to guide them in land-use projects and the development of infrastructure in vulnerable areas in the future.
   - iv. The aforementioned agencies should:
     - a. Consider requiring applicants to address how sea-level rise will affect their project, include design features that will ensure that the project objectives are feasible and that the project will not be rendered unusable or inoperable over its lifespan, that critical habitat is protected, and that public access is provided, where appropriate.

by potential safety risks, potential biological or natural impacts, or other factors. The local government should determine which areas will need the most attention to avert these risks. The *2009 California Climate Adaptation Strategy* can be a valuable resource in making these determinations if effective adaptation planning tools are continually developed.

There are a number of ways to address climate change impacts. For future land use decisions, general plan amendments may be needed. Safety risks may be outlined and mitigated in a Local Hazard Mitigation Plan. To address public infrastructure, a public works plan may be needed. A climate action plan may be used to prioritize actions that are immediately needed and which actions can be implemented over time.

One tool that has been successful in helping to bring together many levels of government to look at long range planning on the regional and local scale is the California Regional Blueprints Program. Through the development of scenario-based integrated plans, regions and local governments can develop different planning scenarios that achieve a variety of objectives and goals, including GHG reduction and climate change adaptation. Further, the blueprint planning process can help identify areas vulnerable to climate change and identify ways to address those vulnerabilities in an integrated and comprehensive manner. Another tool that can regionally integrate different levels of government around climate adaptation is through the Department of Conservation's Statewide Watershed Program.

As the state works to meet its GHG reduction goals, adapt and plan for climate change impacts, and restore the economy, the entire state, including all levels of government, non-profits, businesses, private property owners and the general population should, when appropriate, evaluate how and where critical infrastructure is developed, what types of structures are allowed to be built in certain locations, and how to best protect natural resources.

Finally, more and more infrastructure projects will need to account for climate change impacts to the project. Currently, to the extent required by CEQA Guidelines Section 15126.2, all significant state projects, including infrastructure projects, must consider the potential impacts of locating such projects in areas susceptible to hazards resulting from climate change. Section 15126.2 is currently being proposed for revision by CNRA to direct lead agencies to evaluate the impacts of locating development in areas susceptible to hazardous conditions, including hazards potentially exacerbated by climate change. Locating state projects in such areas may require additional guidance that in part depends on planning tools that the CAS recommendations call for.

Near-Term Actions:

a. *Revise* Section 15126.2 of the *CEQA guidelines to direct lead agencies to evaluate the impacts of locating development in areas susceptible to hazardous conditions, including hazards potentially exacerbated by climate change.*

b. *Incorporate climate adaptation considerations into the Strategic Growth Council and Sustainable Community Strategy processes to ensure incentives are provided to communities that are most vulnerable and are preparing for climate change impacts.*

Strategy 3) Improve Emergency Preparedness and Response Capacity for Climate Change Impacts

Even with the best adaptation efforts, not all risks are preventable. As climate change is likely to increase the frequency and in some instances the intensity of extreme events (i.e. heat, drought, flooding, or fires), agencies must periodically review their changing capacity needs. As catastrophic events become more frequent and each draws heavily on private and public resources, every effort must be made to avoid or minimize exposure to these extremes, so as not to overwhelm emergency response capacity.

While it is more effective and less costly to engage in anticipatory planning (prevention and preparation), it is also important to limit the consequences of unforeseen yet inevitable extremes (response, hazard mitigation). Additionally, all sectors with resources or operational processes at risk from climatic extremes